December 1976

Soil Conservation

U.S. Department of Agriculture

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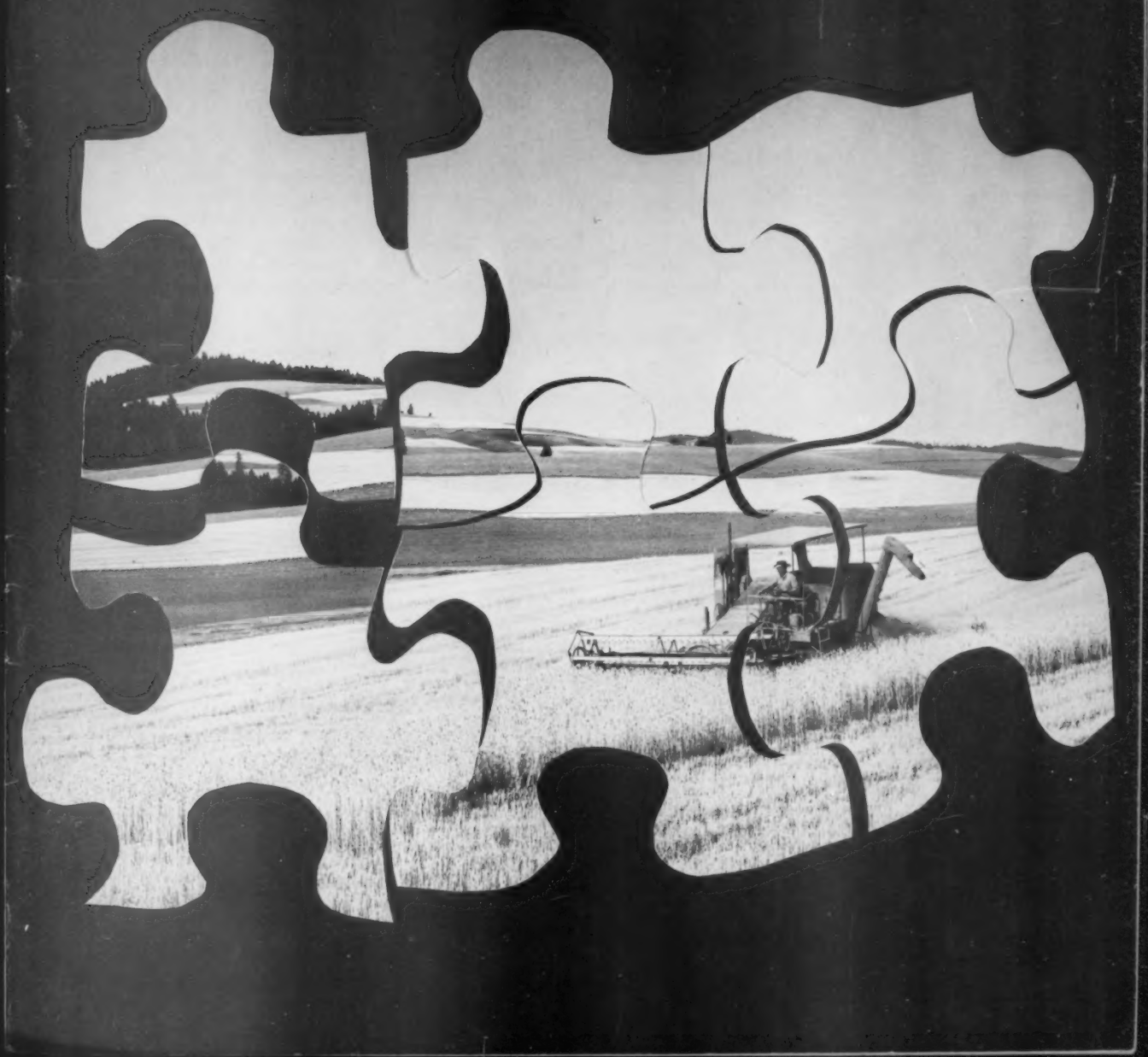


More Help for Minority Farmers

From the Administrator

The benefits of Soil Conservation Service programs are available to all people in conservation districts, without regard to race, color, religion, sex, or national origin.

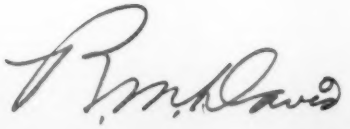
This is not a passive policy. SCS employees are charged with actively encouraging minority land users to become cooperators with their local districts, to attend conservation meetings, and to participate fully in district affairs.

One example of how this policy is transformed into action is in Tennessee, where SCS several years ago initiated a Group Action Program for rural development. Designed to reach minority families, the program enlists the help of USDA agency offices at the county level and rural development specialists at two state universities. Each local project begins with a well-advertised community meeting for minority land users. At the meeting, conservation needs and other problems are identified and discussed, and, at subsequent meetings, a group plan of action emerges. Individuals in each group sign up as cooperators of the local conservation district. So far, SCS has brought needed help to about 1,500 minority families in Tennessee through the Group Action Program.

Special efforts in Texas help make minority farmers and ranchers aware of SCS technical assistance. Public information efforts have included production of Spanish-language radio and TV announcements and publications geared to conservation needs around Spanish-speaking communities. Campaigns to recruit bilingual employees have enabled SCS to conduct Spanish-language conservation workshops and to provide effective onsite conservation planning help.

In several states, emphasis is given to opportunities for work with American Indians. In Oklahoma, the Cherokee Nation has received help on critical-area treatment efforts through the Cherokee Hills Resource Conservation and Development Area. In Washington, modern soil survey information has led to irrigation and drainage improvements in the 225,000-acre Yakima Indian Reservation Irrigated Area. In South Dakota, Cheyenne River Sioux operate their own ranches under Great Plains Conservation Program contracts.

These are a few examples of the kind of creative assistance that truly extends the benefits of soil conservation to more people. There are others—with these and other minority groups. We expect to see conservation aid extended even more in the months and years ahead.



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John A. Knebel
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Cover:
In a nationwide study, SCS identifies 111 million acres of land suitable for conversion to cropland if needed . . . and where they are in the 10 farm production regions. See story on page 5.

Soil Conservation

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by William M. Johnson

"Very Little Time To Protect Our Precious Cropland Reserve"

The reserve of 111 million acres of potential cropland estimated by the Soil Conservation Service would seem to be enough to take care of the nation's needs for increased production for the foreseeable future.

But the same SCS study that provided the estimate shows a disturbing trend of loss of cropland to competing, more intensive uses. The 111-million-acre reserve will not be available for cropland for long.

The SCS potential cropland study shows that between 1967 and 1975, 2 million acres were urbanized each year in the United States. For every acre taken by urban development, at least 1 additional acre is leapfrogged and isolated, so that it, too, is no longer available for cropping. This adds up to 4 million acres a year going to urban uses. Another 1 million acres a year, according to the study, are converted to lakes, ponds, and reservoirs.

At this rate—5 million acres a year if present trends continue—we will develop 120 million acres between now and the year 2000. About a third of this total—36 to 40 million acres—will be taken from cropland. Replacing this cropland may require farming some low-yielding, erosive, wet, stony, shallow, and drouthy soils.

We are facing a squeeze in productive capability only a few years from now. We have very little time in which to build a protective fence around a previous potential cropland reserve or lose it for all time.

It is important to note that a significant part of this land is in Standard Metropolitan Statistical Areas (SMSA's). Seventeen percent of all United States farms are within SMSA's and these farms produce 21 percent of all agricultural products sold. Increasingly, however, this land is being converted to commercial, residential, and industrial uses. According to a recent Domestic Council report to Congress, in the 22 years between 1950 and 1972, 17 states lost more than 20 percent of their taxable farmland, 9 states more than 30 percent, 4 states more than 40 percent, and 2 states more than 50 percent.

Another aspect of this is the loss of the best agricultural land—prime farmland. About a year ago, the issue of prime farmland was reviewed and discussed in considerable detail at the Prime Land Seminar sponsored by the U.S. Department of Agriculture. One of the outgrowths of the seminar was renewed dedication by USDA to protect and preserve prime farmlands, as expressed in policy statements by the Secretary.

Prime farmland is like prime beef—it's the top grade, the best. It is land best suited for and available for producing food, feed, forage, fiber, and oilseed crops. Prime farmland consists of soils that have an adequate, dependable moisture supply, either from natural rainfall or irrigation; soils that are warm enough and have a long enough growing season for the crops otherwise adapted to the area; soils that are neither too acid nor too alkaline for good plant growth; soils that are permeable to water and air; soils that are not so stony as to interfere with cultivation with large machinery, and soils that are not highly erosive. Using land capability criteria, prime farmland corresponds closely to Classes I and II, with perhaps some areas of Class III soils. The Conservation Needs Inventory of 1967 shows a total of 334 million acres of Classes I and II in a billion and a half acres of nonfederal rural land that we sampled. Not all of that land, of course, is cropland, nor is all of the noncropland available for conversion to cropland.

According to our best judgment, almost all of the available prime farmland is being cropped in the United States. Of the estimated 111 million acres of potential cropland remaining, only 24 million acres qualify as prime farmland.

Adapted from paper presented by Mr. Johnson, deputy administrator for technical services, SCS, at the Combined Western Sectional Meetings of the American Society of Animal Science and Canadian Society of Animal Science, Washington State University, Pullman, Washington, July 20, 1976.

The potential cropland study completed by SCS this year provides not only information on the national level but also by farm production region. In the report, SCS notes changes in land use in the regions since 1967 as well as distribution of cropland reserves.

by Ray Dideriksen

Potential Cropland: A Regional View

About the Study . . .

SCS's potential cropland study was initiated on May 1, 1975, in response to the urgent need for current data on the potential for developing new cropland.

USDA's Economic Research Service and Iowa State University Statistical Laboratory assisted in the design of the study, geared to use part of the sample sites from the 1967 Conservation Needs Inventory and to provide accurate regional and national data. As with the 1967 study, only nonfederal land and federal cropland were included—totaling 1.4 billion acres.

To carry out the study, SCS district conservationists visited 41,000 sites in 506 counties selected on a random basis. They determined present land use, problems in converting noncropland to cropland, and action needed to convert it to cropland—whether all that was needed was tillage or whether major work by farmers or federal agencies would be required. The district conservationist then met with representatives from other agricultural agencies in the county to determine for each site not in cropland what its potential for conversion would be in the next 10 to 15 years.

Information on prime farmland was provided by SCS state staffs. All of the data was then sent to the Statistical Laboratory for expansion to regional and national totals.

How much land is left in the United States that can be converted to cropland . . . how much cropland is going into urban development . . . what land use changes have occurred since the last comprehensive Conservation Needs Inventory in 1967?

These are among the questions answered nationally and by region in the Soil Conservation Service's potential cropland study of nonfederal lands completed this year.

Nationally, 111 million acres of land have the quality and availability for conversion to cropland. This potential cropland is about a fifth of the total cropland acreage and roughly equivalent to the acreage planted in corn, oats, and sorghum in the United States last year. It is well below former estimates that went as high as 266 million acres.

Irreversible losses of land to urban development are also higher than previously estimated. An average of 2 million acres a year is urbanized and half of this is Class I to III land, with soils particularly suitable for cultivation. Since 1967, 16.6 million acres have been converted to urban uses and a third of this was cropped in 1967. Currently, another 24 million acres are being held for future urban use. Another million acres a year are being converted to ponds, lakes, and reservoirs and about half of this is Class I to III land.

Conversion to urban uses was highest in the Corn Belt, Southeast, Northeast, and Pacific regions.

The total land in crops, forests, and woodland has dropped in the last 8 years while pasture and range acreage has increased.

The land in crops dropped 31 million to 400 million; woodland and forest land dropped 70 million acres to 375 million; and pasture and rangeland increased 64 million to 571 million acres.

In the Great Plains, the study indicates that fewer acres of marginal land are being farmed. In the Corn Belt, the acreage going out of cropland appears to be the more erosion-prone land.

Prime farmland in crops total 250 million acres in the 10 farm production regions. Another 24 million acres of prime land has a high potential for conversion to cropland. Much of the public land that can be converted to crops occurs in the Southern Plains, Appalachian, Northern Plains, and Corn Belt regions.

In brief, by farm production region, the study shows:

Northeast

Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

Of the nearly 100 million acres in the region, 2.8 million went into urban use during the 8-year period and another 2.7 million are being held for urban use. More than half of the land converted to urban use was Class I to III.

In agricultural uses, only pasture and rangeland acreage increased. It rose 1 million acres to total 7 million acres in 1975. A net loss of 4 million acres of cropland was recorded in the 8-year period to bring the total to 17 million acres. Forest land showed a similar 4-million-acre loss, dipping to 63 million acres.

About 15 million acres are committed to noncropland uses, such as timber, urban, and wildlife, and have little or no potential for conversion to cropland. Land with a high or medium potential for conversion to cropland totaled 3 million acres.

Prime farmland totals 17.9 million acres and 8.9 million are in crops.

Since 1967, 16.6 million acres have been converted to urban uses. A third of this was cropped in 1967. Currently, another 24 million acres are held for future urban use.

Corn Belt

Iowa, Illinois, Indiana, Ohio, Missouri

Most of the nearly 6 million acres that went out of cropland in the Corn Belt from 1967 to 1975 were erosive.

The study shows nearly 3 million acres in Land Capability Class IIIe—with limitations due to moderately steep slopes, high susceptibility to water or wind erosion, or severe past erosion—had gone out of cropland since 1967. To some extent, this is because farmers, with larger units and increased mechanization, are spending their efforts on their better lands.

Some of this land was converted to pasture, as explained by a 6-million-acre increase in pasture since 1967 to total 29 million acres. Forest land decreased about 4 million acres to 25 million.

This region has the most prime farmland in the nation.

Of the nearly 77 million acres of prime farmland in the Corn Belt, 61 million are in cropland. Three million more need only to be tilled to be converted to cropland. The total land in reserve with a high or medium potential for conversion to cropland is 15 million acres.

Land shifts since 1967 indicate that more than 4 million acres of what is now pasture and range came from forest land and that more than 8 million acres of cropland have gone into pasture.

Nearly 3 out of 4 acres in the Corn Belt inventory are in Land Capability Classes I, II, or III—land most suited for cultivation. Of the nearly 152 million acres of private lands in the Corn Belt, about 2 million were converted to urban use in 8 years. Nearly 60 percent of it is in cropland, and another 1.5 percent would require only tillage to convert to cropland.

Since 1967, more than 16 million acres have been converted to urban uses: a third of these acres were in crops in 1967 (far left photo). In addition, an average of 1 million acres a year are being converted to ponds, lakes, and reservoirs (at left). About half of this is Class I to III land—land with soils particularly suitable for cultivation.

Mountain States

Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming

This is the only region in the country where the acres in crops remained constant, at 40 million acres, from 1967 to 1975. The region has 14 million acres that have a high or medium potential for conversion to cropland. Only a small percentage of this reserve would be prime. There are 18 million acres of prime farmland in this region and nearly 90 percent is now in crops.

The acreage in pasture and rangeland increased sharply, from 188 million to 208 million, during the 8-year period and was primarily converted from forest land. Forest land decreased from 22 million acres to 14 million acres. It is important to note that the study covered only private lands. Much of the land in the Mountain States is federally owned.

Conversion to urban uses accounted for a small percentage of the land—less than one-half of 1 percent of the 275 million acres of privately owned land in the region. Only two-tenths of 1 percent of the land was being held in 1975 for urban development.

Lake States

Michigan, Minnesota, Wisconsin

This region—with 44 million acres in crops in 1975—had about 2 million fewer acres in crops than 8 years earlier. Forest land decreased by more than 3 million. Total land in pasture and range remained unchanged.

However, during the 8-year period about 1 million acres of forest land were converted to pasture and range and another million to cropland. Three million acres of cropland were converted to pasture and 2 million went out of production, some of it being held for urban expansion.

Of the privately owned land in this region, about 40 percent is cropland and nearly 1 percent is being held for urban use. One percent has been converted to urban use since 1967. Nine million acres with a high or medium potential for conversion to cropland make up the reserve. Of the 38.4 million acres of prime farmland, nearly 70 percent is already in crops.

Those regions with the least land with a high or medium potential for conversion to cropland in the contiguous United States are the Mountain States and the Northeast.

Appalachian

Kentucky, North Carolina, Tennessee, Virginia, West Virginia

This region saw a 3-million net loss in cropland acreage from 1967 to 1975 to bring total land in crops to 20 million. Forest land also dropped nearly 2 million acres to total 63 million in 1975. Pasture and rangeland gained more than 3 million acres to reach nearly 22 million.

Urban land use took more than 2 million acres during the 8-year period, and water covered about 270,000 more acres for lakes, reservoirs, and ponds. An additional 3 million acres are being held for urban expansion and have a low potential for conversion to cropland.

Nearly 5 million acres, however, have a high potential for cropland with essentially no problems involved in conversion. A total of 11 million acres have a high or medium potential for conversion to cropland.

Of the 111 million acres of privately owned area in the region, 18 percent is in crops, 2 percent was converted to urban, and 1 percent is being held for urban use. Of the 26.4 million acres of prime farmland in this five state region, half are in crops.

Southern Plains

Texas and Oklahoma

The land in crops and forest in these two states decreased substantially from 1967 to 1975, with most of it going into pasture and rangeland. Cropland totaled 41 million acres in 1975—7 million less than in 1967. Forest acreage was more than halved, dropping from 39 million acres to 16 million. Pasture and rangeland, however, increased 20 million acres to total 139 million acres.

In the study, SCS determined nearly 11 million acres—most now in pasture and range—have a high potential for conversion to cropland. Another 140 million acres have little or no potential for conversion because of lack of dependable water, high erosion hazards, or commitment to noncropland use.

These two states have 67 million acres of prime farmland, 29 million of which are now in crops. Another 33 million acres are in pasture and range, with 6 million acres of that being readily convertible to crops. This is the greatest reserve of prime land of any region.

Progress in converting land poorly suited for crops into other uses showed up clearly in the 10-state Great Plains area. While marginal land accounted for more than one out of four acres of the 204 million acres in crops in 1967, it accounted for less than one out of eight of the 163 million acres in crops in 1975.

Last year, 41.8 percent of the land in crops in the Great Plains area had a severe erosion hazard. Eight years earlier, the figure was 43.5 percent.

Southeast

Alabama, Florida, Georgia, South Carolina

Since 1967, 2.6 million acres in the Southeast have been converted to urban use and additional acres are being held for urban development. Another 3.2 million acres have been used for reservoirs, lakes, and ponds, coming mostly from Class VII and VIII land.

Pasture and rangeland increased during the 8-year period, from 13.5 million to 18.8 million acres. Cropland dropped from 19 million to 16 million and forest land from 73 million to 65 million.

More than 10 million acres now in pasture, range, or forests in the Southeast have a high potential for conversion to cropland. In total the

The Corn Belt has 77 million acres of prime farmland, the most in the nation, 61 million acres are in crops . . . The Southern Plains has the greatest reserve of prime farmland of any farm production region.

Southeast has 18 million acres with a high or medium potential for conversion to cropland, the highest in the nation.

Of 60 million acres in the region with little or no potential for cropland, 22 million are committed to other uses; 22 million are in high density forests; and 16 million acres have problems of frequent flooding.

The region has 23.6 million acres of prime farmland, with about a third of it now in crops. Forests account for 9.5 million acres of it and pasture and range, 4 million.

Northern Plains

Kansas, Nebraska, North Dakota, South Dakota

Pasture and rangeland increased by nearly 4 million acres between 1967 and 1975, while cropland and forest land decreased. Land in crops totaled nearly 91 million in 1975, nearly 4 million below the 1967 figure. Forest land—at 1.5 million acres—was half what it was 8 years earlier. About half of the forest land was converted to cropland and the remainder to pasture and range.

More than 12 million acres—primarily pasture and rangeland—have a high potential for conversion to cropland in the Northern Plains. A third of the acreage would require only tillage. In total, 17 million acres have high or medium potential for conversion to cropland.

Relatively few acres have been converted to urban use over the last 8 years—only four-tenths of 1 percent of the 183 million acres in the inventory. An additional 51,000 acres were held for urban use.

Delta States

Arkansas, Louisiana, Mississippi

Ten million acres in these states have a high or medium potential for conversion to cropland. Much of the land change in these three states since 1967 is from forest to cropland, especially to soybeans. A total of 28 million acres have gone out of forest land. Cropland had a net addition of more than 1 million acres to total 20.2 million in 1975.

Since the 1967 inventory, 1 million acres have been converted to urban uses and to ponds, reservoirs, and lakes.

The region has nearly 30 million acres of prime farmland, with about half now in crops.

Pacific

California, Oregon, Washington

Since 1967, these three states have recorded decreases in cropland and forest land and an increase in pasture and rangeland.

Cropland was down from 25.3 million acres to 21.9 million; forest land, from 43 million to 36 million; and pasture and rangeland, up from 33.3 million to 38 million acres.

During this time, 1.3 million acres were converted to urban use and another 110,000 acres to ponds, lakes, and reservoirs. Two million acres are being held for urban development.

The study shows 2.7 million acres not now in crops have a high potential for conversion to cropland. The region has only 3 million acres with a high or medium potential for conversion to cropland—tying with the Northeast for the least potential cropland or any region in the lower 48 states.

Prime farmland totals 13.8 million acres, of which 8.9 million are now in crops.

Mr. Dideriksen is Director, Inventory and Monitoring Division, SCS, Washington, D.C.

For every acre taken by urban development, at least 1 additional acre is leapfrogged and isolated so that it, too, is no longer available for cropping.

Working Together For Quality Living

by Betty Joubert

In a town in Louisiana, flooding was an expensive and growth preventing problem until solved through cooperative efforts involving the Twin Valley RC&D.

District Conservationist Alvy Slatten and Mayor H. Truman Crawford inspecting a stand of browntop millet on a new ditch that will drain the Coushatta High School grounds.

"Working together for quality living" was the slogan coined by a group of Coushatta, Louisiana, citizens for their recently completed flood control project.

Nearly 8 miles of improved channels are now draining an area of almost 3,300 acres. H. Truman Crawford, mayor of Coushatta, believes the project is "the best thing that ever happened" for the town's 1,492 citizens.

Coushatta flooded with every 3-inch rain, and in some places water stood for weeks afterwards. "Water can stand in a field for a short while and there's little danger, but when it's in your home for even one second, you've got a very expensive problem," said Alvy Slatten, Soil Conservation Service district conservationist at Coushatta.

Flooding caused other problems as well. Coushatta had no well drained land on which new businesses could build. "The town's young people were finishing school and moving away because they couldn't find jobs or quality homesites here," said Mayor Crawford.

Coushatta citizens found solutions to these problems when the city became a cooperator with the Saline Soil and Water Conservation District and learned about the Twin Valley Resource Conservation and Development (RC&D) area.

Approved in 1969, the Twin Valley RC&D area covers 2,940,644 acres in the parishes of Caddo, DeSoto, Natchitoches, Red River, Sabine, and Vernon. Each parish sends a representative to steering committee meetings to discuss problems and decide which are the most pressing. In 1970, the group decided that flood protection in and around Coushatta should be given top priority.

Early in 1971, SCS surveyed the area and helped RC&D leaders plan flood protection and control measures. The town of Coushatta and the Twin Valley RC&D agreed to finance the project.

Construction started in June 1973. And, only 3 years later, the town of Coushatta is seeing the benefits.

Because the improved channels carry off rainwater more quickly, residents in the former flood area no longer have to worry about water entering their homes or standing in their yards. This stagnant water is no longer a breeding place for mosquitoes, cutting Coushatta's mosquito control program needs almost in half.

The State Department of Highways built new culverts and two new highway bridges in conjunction with the project. Central Louisiana Electric Company and South Central Bell replaced lines removed during construction.

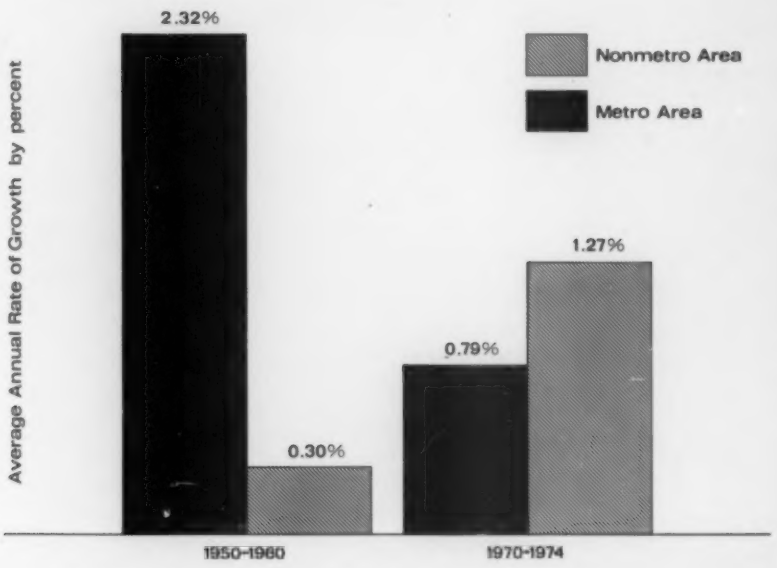
Assured that their property would be flood-free, many businesses tore down their old buildings and built more modern ones. Land that was once considered unusable is now dry and available for construction. Thirty lots are surveyed and ready for development.

The project helps check erosion on nearby channels and bayous. It also restored 100 acres of fish and wildlife habitat in the area.

Ms. Joubert is public information specialist, SCS, Alexandria, Louisiana.

In its 1976 annual report, the Council on Environmental Quality analyzes population shifts in the United States since 1970—including why nonmetropolitan areas are growing at a greater rate than either metro areas or the nation as a whole.

U.S. Population Shifts Toward Rural Areas



For the first time in our 200-year history, nonmetropolitan areas of the United States are growing in population faster than metropolitan areas.

Between April 1970 and July 1974, counties not included in a Standard Metropolitan Statistical Area grew 5.6 percent. During the same time, metropolitan areas grew only 3.4 percent, and U.S. population as a whole increased 4.0 percent.

These increases have resulted in an average annual rate of population growth of 1.28 percent for nonmetropolitan areas, 0.79 percent for metro areas and 0.92 percent per year for the United States as a whole.

This significant change in U.S. population trends is analyzed in *Environmental Quality—1976,* the 7th annual report of the Council on Environmental Quality.

The report notes that—

- Growth outside urban areas has taken place in all major regions of the U.S. The shift was first noted in the midsixties in such areas as the Great Lakes cutover lands, the Ozarks, Tennessee Valley, and Texas Hill country, and now includes many areas of the West and South. Most of these same areas were losing population during the decade 1950-60.
- The growth in rural areas is not limited to counties adjacent to cities. Further, nonmetropolitan counties with small towns and villages and those with no town of more than 2,500 residents—the most rural areas of the country—are now growing as fast as counties with much larger towns.
- In 1970-74, some 1.6 million more people moved into nonmetropolitan areas than left them. This is in direct contrast to previous trends.
- The flow of people into rural areas is about equally divided between those coming from central cities and those from suburban areas.

Environmental Quality—1976 explores several possible reasons for the shifts—

- A large proportion of the American people now expresses a preference for living in rural areas.
- People who live in rural areas are more apt to be satisfied with where they live than town and city residents.
- Growth of the Interstate Highway System now makes it possible to commute more miles from country to city.
- Movement of farmers and their families off the land—a trend since the 1920's—seems to have stopped.
- Unemployment in rural areas is now below the rate in metro areas, and incomes are increasing faster. Rural poverty has dropped substantially.
- Retirement settlements have sprung up in many rural areas besides California, Arizona, Florida, and Cape Cod. Retirement areas now include 8.6 million people in 360 counties.

Kansas Engineer George R. Smith began his soil and water conservation career nearly 42 years ago on an erosion control project in Kansas. He recalls those early days—when trainee engineers were paid 40 cents an hour and equipment was run day and night to help farmers convert from straight row to contour farming.

by George R. Smith

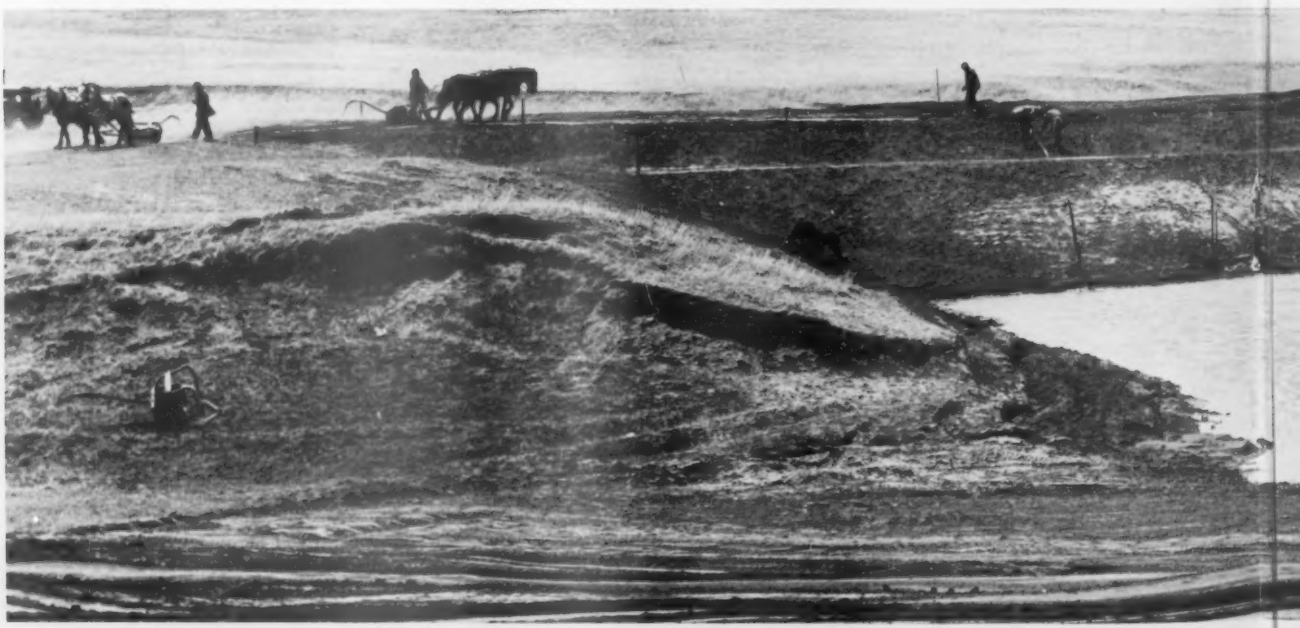
Pioneering on the Conservation Frontier

Two things were obvious to the 20 trainee engineers and soil scientists who went to Mankato, Kansas, in February 1935 to join Limestone Creek Erosion Control Project staff. The land needed us and we needed work.

Most of us had graduated a year or more earlier—at a time when finding a job was almost as difficult as keeping Kansas topsoil from blowing into the Atlantic Ocean. We were getting a chance to help solve both problems.

The Limestone Creek project was one of 40 erosion control projects around the country established under the technical direction of the Soil Erosion Service (SES). Soon after the project was started in 1934, a local newspaper called SES "the largest employer of labor in Jewell County."

Manager of the project was Dr. Frank L. Duley, who organized a technical staff of soil scientists, agronomists, foresters, and engineers. The project had four associated Civilian Conservation Corps (CCC) camps—at Burr Oak, Lebanon, Esbon, and Ionia. Each 200-man camp was administered by the U.S. Army, with civilian supervisory and technical personnel directing



work on conservation measures.

"SES trainees" became "SCS trainees" in April 1935 when the Soil Conservation Service assumed the activities of the Soil Erosion Service. Trainees were paid about 40 cents an hour for 44 hours of work a week, providing us about the same income as people who were on relief at the time. But rooms were available at $2 a week and meals cost a quarter.

Most of us carefully managed our money during the 6-month training period so we would be able to purchase the expected SCS "uniform" of forest green shirt, boot pants, and ranger hat, and a horsehide jacket complete with brass buttons. A good pair of oil-tanned field boots was the biggest single expense at $20.

Although enrollees at some of the early CCC camps in Kansas worked on U.S. Forest Service projects, most were assigned to work with SCS and early conservation districts on demonstration projects and on construction of multiple-purpose state lakes such as Seneca, Lone Star, and Toronto.

Project Manager Duley helped develop the concept of providing technical assistance to farmers and ranchers in their efforts to control soil erosion and conserve soil and water resources.

Staff members sought out farmers and ranchers who were willing to have their land treated with conservation practices such as terraces, diversions, vegetative waterways, grade stabilization structures, ponds, pasture furrows, tree and shrub plantings, dams for gully control, and seeding eroded cropland to adapted grasses.

Everything was furnished by the federal government without cost to the landowner—technical services, equipment, materials, and labor. But, it still took some persuasion from conservation-minded neighbors to get the job done.

At the time, terracing was seen as the primary conservation need. To meet the demand and to best use the heavy earthmoving equipment involved, CCC operators worked 10-hour shifts around the clock.

Most farmers used light, horse-drawn equipment: There were very few tractors on Kansas farms at the time. So, CCC workers used government equipment to rework the cloddy soil to farmable conditions after installing the terraces.

The story often was told that a farmer would go to bed after watching us stake out a field and wake up with some surprise the next morning to see that he had been transformed from a straight-row to a "contour conservationist." (It could have been true, for the CCC construction crews spent anywhere from 1 to 3 days on a typical 160-acre operation.)

In addition to conducting the demonstration work, the Mankato staff prepared trainees to take on the anticipated expansion of the SCS and CCC conservation work into other counties. I went on to three similar assignments, including one in Labette County where the state's first conservation district was formed.

World War II brought the closing of the CCC camps and an end to the strange sight of big terracing equipment moving through the darkness of the Kansas plains, lights shining ahead and behind to keep sight of stakes that had been placed the day before.

Mr. Smith is state conservation engineer, SCS, Salina, Kansas. He is retiring next month.

Scene from the thirties: a stockwater pond under construction in Kansas. The pond was put in to help the farmer distribute his water supply for livestock to prevent overgrazing and control erosion.

Game Birds Spring Up On Native Pasture

by Lyle Asell,
Ronnie George,
and Jack Coffey

Native grass prairies are making a comeback in southern Iowa as pastures for cattle. A new study shows that they are also providing excellent nesting sites for both game birds and songbirds.

Game birds, cattle, farmers, and hunters may all be the winners if recent interest in native prairie grasses continues in southern Iowa.

In the last 5 years, farmers have seeded 4,000 acres to native "warm season" grasses that produce excellent pasture for cattle during summer months. A recent study shows that the plantings also produce an environment that dramatically increases the nesting successes of both game birds and songbirds.

Ring-necked pheasants, for example, built a third more nests in switchgrass, one of the native grasses studied, than in an alfalfa and orchardgrass pasture, and the number of successful nests—where chicks hatch—was also high. Wildlife biologists located 38 nests on 138 acres of switchgrass and determined that nearly half the nests were successful. The successful nests averaged one per 8½ acres of switchgrass.

On the other hand, the biologists located only 11 nests on 66 acres of a cool season pasture of alfalfa and orchardgrass. All of these nests were destroyed during normal hay mowing in the spring and 8 of the 11 hens were killed. Pheasants in Iowa prefer the alfalfa-orchardgrass hayfields for nesting.

The study, begun 3 years ago, was initiated through sponsors in the Chariton Valley Resource Conservation and Development area. Participants include the Iowa Conservation Commission; the Soil Conservation Service; the Lucas, Wayne, and Appanoose Soil Conservation Districts; the U.S. Army Corps of

At far left, this pheasant nest was one of 38 found in a study of 138 acres of switchgrass, one of the native grasses studied. At near left, a bobwhite quail.

Engineers; and several area farmers.

The key to success for wildlife, the study indicates, is the same high-level management practices that farmers use to maintain native grasses such as switchgrass, indiangrass, and big bluestem.

This includes not grazing pastures until early July and not grazing closer than 8 inches to the ground. The planned grazing assures that the pastures are not being grazed during the heavy nesting periods of May and June, and that cover is left for the following winter and spring.

In contrast, "cool season" pastures, with such grasses as brome, orchard, and bluegrass, reach their peak production during the spring and fall and are grazed or mowed during the wildlife nesting season.

By rotating cattle between two pasture types, farmers use each when growth and forage quality are at their peaks.

With the growth of this rotation system, in southern Iowa in recent years, the study was aimed at determining the possible effect of the system on game birds and songbirds. To achieve the goal, wildlife biologists have searched 240 acres of native grass for nests in the last 3 years.

They discovered 137 nests—57 of ring-necked pheasant, 5 of bobwhite quail, 5 of mourning doves, and 70 of songbirds.

The study shows—

—Pheasant nesting densities were highest in mixed native grass, in little bluestem, and in switchgrass.

Pheasant nest success was greatest in mixed native grass and in switchgrass.

—Quail nesting densities and nest success were greatest in little bluestem.

—Mourning doves had the greatest nesting densities and nest success in indiangrass. This may be as a result of a greater amount of bare ground between clumps, providing doves with more areas to nest and a more diverse food supply.

—Songbird nesting densities were highest in big bluestem. Common songbirds nesting in the native grasses were red-winged blackbirds, eastern meadowlarks, dickcissels, yellowthroats, and field sparrows.

The ongoing study began in 1973 when wildlife biologists seeded 13 plots totaling 69 acres to native grasses at Lake Rathbun, a U.S. Army Corps of Engineers project authorized for flood control and recreation in southern Iowa. Later in the study, three more plots totaling 40 acres were added on private land.

SCS provided technical assistance with information on both seeding establishment and management of the native grasses and in cattle stocking rates and grazing periods. The SCS plant materials center at Elsberry, Missouri, provided switchgrass, indiangrass, and big bluestem for the study.

The Iowa Conservation Commission provided labor, equipment, and materials; established the study plots; collected field data; and evaluated results.

The study plots for the native grasses ranged from 5 acres to 20 acres and were treated to simulate private management of warm season pastures. They were mowed for hay in July; grazed during July and August; and harvested for seed in September.

Wildlife biologists made intensive searches for nests in the pure stands of switchgrass, indiangrass, and big bluestem in 1974, 1975, and 1976. Mixed stands of the three species and an actual prairie remnant, consisting mostly of little bluestem, also were included in the study.

To provide a direct comparison of nest density and success in cool season hayfields, privately owned alfalfa and orchardgrass hay meadows adjacent to the study area also were searched.

Results of the study to date appear promising and would indicate that as more acres are planted to native grass pastures, both the livestock and wildlife will benefit.

Mr. Asell is biologist, SCS, Des Moines, Iowa.
Mr. George is wildlife research biologist, Chariton Research Station, Iowa Conservation Commission, Chariton, Iowa.
Mr. Coffey is wildlife management biologist, Rathbun Wildlife Unit, Iowa Conservation Commission, Chariton, Iowa.

Unclogging the Cocheco River

by Charles H. Dingle
and Gordon L. Leckie

In New Hampshire, a conservation district supervisor had a dream of returning the Cocheco—which had become "little more than a clogged-up river"—to a haven for wildlife and people. This Bicentennial year, it happened.

While cities across the nation observed the country's 200th birthday with parades and fireworks, members of the Strafford County Conservation District (CD) in New Hampshire participated in a river cleanup project to celebrate their town's heritage.

Bob Hussey, Strafford County CD supervisor, recalled that, "When I came back to Rochester after World War II, the Cocheco River was little more than a clogged-up sewer. It was choked with debris and so polluted that even the muskrats were dying. Since that day, I've dreamed of seeing the Cocheco returned to a haven for animals and a place for trout to spawn. I knew we could do it because clear, cold spring water was still flowing into the murky Cocheco."

After 3 years of planning, Hussey, with the help of Dave Bennett, district conservationist for the Soil Conservation Service in Rochester, and Janice Lygren, a fourth grade teacher and a district board member, began to organize townspeople in June 1976 for the big cleanup.

As coordinator, Hussey contacted nearly 40 landowners who control access along the river. "Not one turned me down," he said.

Maureen Stabile, district clerk, wrote letters and telephoned local residents and businessmen to solicit volunteer labor and donated equipment. "The response was tremendous; everyone seemed eager to contribute," she said.

Mayor John Shaw offered city-owned equipment for the cleanup. He also offered to follow up on the project by finding a way to eliminate the sources of raw sewage.

In early August, Hussey, a professional logger, coordinated work parties to clear access roads to the river. Local firms donated chain saws and logging equipment.

The months of planning and preparation culminated on Saturday morning, August 28, when about 150 townspeople gathered to clean the Cocheco. At 7 a.m., Hussey turned the control valve at the upper dam to stop the river. The Salvation Army was on hand at the Fairgrounds to serve coffee and donuts to workers. The Rochester Fire Department Local 1451 stood by ready for action in case of emergency. Dr. Alexander Smith, head of the medical staff at Rochester Hospital, instructed his emergency staff to treat injuries free of charge. The local chapter of the national REACT team coordinated the operation with its two-way radio system.

Mrs. Lygren shuttled people, supplies, and messages from one end of the cleanup area to the other. She accompanied a local newspaper reporter to key action spots on the river. The event was reported by TV, radio, and newspapers throughout the state.

Workers concentrated on the 1.7 mile stretch of the river between Wyndotte Mill Dam and Gonic Dam, where a city park is envisioned. This 10-acre wooded area, in the heart of the city, was donated for a park about 50 years ago. The river cleanup spurred renewed interest in developing a park and outdoor conservation education center.

The most unusual workers were a pair of oxen owned by Frank Scruton of the Rochester area. With their tremendous strength, the oxen—a show team—were able to dislodge logjams that heavy equipment could not reach.

Townspeople dragged tires by the hundreds from the riverbed. Twenty-five shopping carts were retrieved.

View from a bridge: Conservation district supervisor Bob Hussey pulls debris from the edge of the Cocheco in downtown Rochester, New Hampshire. Below: Car seats are tossed and tires are pulled from the river as volunteers more than "pull their own weight."

They pulled out mattress springs, refrigerators, and garbage. The riverbank was lined with everything from plastic flowers to stoves.

Most of the cleanup ended in October with grading and seeding along the riverbank to stop erosion.

To keep the river clean, a new city ordinance imposes a $100 fine for throwing trash in the Cocheco.

Hussey's enthusiasm is contagious: the citizens of Dover, downstream from Rochester, are now planning a cleanup project of their own.

He hopes to see the entire length of the Cocheco soon fit for both people and wildlife again.

Mr. Dingle is assistant state conservationist, SCS, Durham, New Hampshire.
Mr. Leckie is public information officer, Northeast Technical Service Center, SCS, Broomall, Pennsylvania.

by James W. Carr, Jr.

To offer protection to motorists and wildlife alike during Nebraska's cold winters, a natural resource district has initiated a program to plant living snow fences.

Nebraska Snow Job

Putting up wooden slab fences to prevent snow drifting on county highways is a Great Plains winter ritual.

But in central Nebraska, the scene is changing.

In the last 2 years, 10 cooperators with the Lower Loup Natural Resources District (NRD) have agreed to put in nearly 4 miles of living snow fences.

The tree plantings are to provide cover for wildlife, but will also save the county roads department an estimated $3,800 a mile for new snow fence installation and $300-a-mile annual maintenance costs.

To participate in the living snow fence program, a farmer or rancher contributes a strip of land 100 feet wide along a county road for a 10-year period. He must agree to remove it from agricultural production and to exclude it from livestock.

The Lower Loup NRD provides fencing materials and plants the seedlings. The Soil Conservation Service, through the district, provides technical assistance in planning and designing the tree belts.

The Valley County roads department puts up the fences, prepares the ground, controls weeds until the seedlings are established, and replenishes the stock for 3 years.

The Agricultural Stabilization and Conservation Service provides cost-sharing assistance to participants for trees and planting.

"The combined living snow fence and wildlife habitat program entails planting three rows of conifers, primarily redcedar," said Dick Beran, general manager of the Lower Loup NRD.

"About half of the area is planted to trees and the rest is left undisturbed for wildlife nesting and roosting cover. Some of our plantings this year include a row of shrubs in the wildlife area for additional cover and food," he said.

The idea is spreading to other parts of the NRD, the largest in the state. For example, a local wildlife club plans to plant several rows of milo between the rows of trees to provide food for wildlife and to reduce winter damage to the new seedlings.

A bonus of the program has been recognition of the NRD for its efforts. The Nebraska chapter of the Society of American Foresters has presented the NRD with its award for outstanding contributions to forestry for 2 consecutive years.

Mr. Carr is forester, SCS, Lincoln, Nebraska

Above: The "new look" in Valley County. This living snow fence consists of rows of eastern redcedar, Austrian pine, hackberry, and honeysuckle. At right: County road crews still carry out the winter ritual in most areas of putting up snow fences.

Clubwork and Conservation

by Chris Williams

Jerri Wagner's interest in clubwork and conservation has opened many doors—from conservation district supervisor to mayor of Prescott, Arizona, to president of the 10-million-member General Federation of Women's Clubs.

The new president of the General Federation of Women's Clubs (GFWC) is a conservationist.

Jerri Wagner was born and raised around conservation on a Texas farm and has practiced and promoted conservation in California and Arizona in many roles, from club member to mayor. Her strong interest in the wise use of natural resources will be demonstrated now from Washington, D.C., where she will live for the next 2 years in the historic N Street headquarters of the 10-million-member Federation.

"Conservation has always been an important and strong part of our program," Mrs. Wagner said. "The Federation was founded in 1890 and by the turn of the century, members had adopted a strong conservation resolution."

Winding up her term as mayor this year, Jerri Wagner will be moving to the nation's capital for 2 years.

Mrs. Wagner's own leadership in conservation is apparent. She and her husband Harry and their three daughters moved to a ranch in Prescott 20 years ago, and she has been a supervisor for the Chino Winds Natural Resource Conservation District nearly half of those years.

Elected to the city council at about the same time, she helped found the Cocopai Resource Conservation and Development (RC&D) Council and became its first chairman. From there, she helped found the Arizona Association of RC&D Areas—and became its first president.

Her interest in land use planning and natural resource conservation brought her prominence and led to her election as mayor of Prescott 2 years ago. She is the first woman to be elected mayor in Arizona.

As mayor, she is especially proud of the completion of the new library and the beginning of a sewer system for the 110-year-old town of 17,000.

"By providing an 'open door' approach not only for residents but also for employees, we have listened to and solved many problems and developed a cooperative effort," she said.

She attributes this success partly to her work with RC&D. "The RC&D concept provides a unique opportunity for solving local problems," she said. "The successes we had were because local people and many representatives sat down together and communicated. The people stated their problems and someone had a program or solution for them."

Mrs. Wagner sees her own success as a result of volunteer activities.

"You can walk to the top as a volunteer." she said.

"As a young wife and mother 34 years ago, I would have climbed the walls if it hadn't been for club activities.

"Working in executive capacities in women's clubs is the best training currently available for women who want governmental and industrial positions of responsibility."

This year, the Federation launched a series of regional conservation seminars with the theme "Improving the Quality of Life."

The week-long seminars are sponsored by the Federation and Shell Oil Company to train leaders and members of the GFWC to work with groups within states and to extend and improve conservation programs.

The seminars will include panel discussions, field trips, and study sessions with specialists in energy and resource management.

"Local clubs have always promoted conservation in their communities. This program is aimed at enhancing that role," she said.

In addition to conservation, Mrs. Wagner has a special interest in art and international relations. She has selected these two fields as subjects for special emphasis during her term.

"I have a theme for my term," she said. "It is 'Arise, activate dreams.'

"These words are a challenge to each of us. Through dedication and effort we can make our dreams a reality.

"To do this requires time and perseverance. But if you get people behind you and work with elected officials, the end result will be met."

Mr. Williams is public information officer, SCS, Phoenix, Arizona.

In Tune With Conservation

by Gary E. Conant

The Stauth brothers have a showplace farm in Harrison County, one of the fastest growing counties in Indiana. Now carefully preparing part of their land for a subdivision, they want to show "that conservation is vital in farming and subdivision development."

Ward Stauth bales hay on the farm he and his brother converted from cropland shortly after World War II.

Ward, wrapped up in his sousaphone, can be seen playing circus band music around the country and at the annual meetings of the Harrison County SWCD in Indiana.

When two brothers who have spent more than a quarter of a century developing a "picture postcard" farm decide to develop part of it for homesites, how do they go about it?

"Clarence and I want to show people that conservation is vital in farming and in developing a subdivision," explains Ward Stauth, who recently retired from the board of the Harrison County Soil and Water Conservation District (SWCD) in southern Indiana after nearly 25 years of service.

Clarence and Ward Stauth began their work in conservation shortly after returning from the war 30 years ago. They joined the newly formed SWCD and, with assistance from the district, developed a conservation plan for their farm. When the soils map showed their farm to be mainly Class VI and VII land—too steep and eroded for crops—they decided to convert it from crops to pasture and hay.

That wasn't easy. Farm machinery was scarce, and they had to put their names on a waiting list for a tractor and a bulldozer. The tractor came first and they began to convert the farm. Hooking up a 3-bottom plow, they built more than 22,000 feet of diversions to control runoff on their long, steep slopes.

"Over the next few years, Ward and I filled in washed-out gullies, cut sassafras, cedars, and broomsedge, and seeded tall fescue, orchardgrass, lespedeza, and clover," recalls Clarence.

When the bulldozer arrived, the Stauths got into earthmoving work. As contractors, they installed many conservation practices on farms in their community.

When they decided about 10 years ago to convert their farm into a subdivision with minimum lots of 2 acres, they again incorporated conservation into their planning.

"We're well aware that developed land can create more of an erosion and runoff problem than agricultural land," Ward said. "We're applying conservation measures during development so that the new residents won't have to tackle these problems after their homes are built.

"We feel our conservation work will pay for itself. The neat, grassed lots will help sell themselves."

The brothers remove the sod as they put in roads and place it around culverts, on waterways, and on the bottom of roadside ditches. They seed the ditchbanks and they sod drainageways in the woods, providing both erosion control and pathways for homeowners.

With the interstate highway completed through southern Indiana this year, and their property now within commuting distance of Louisville, Kentucky, the brothers sold their first lot. They plan to develop gradually, starting with a 21-acre area.

The brothers are also busy planning what they believe will be the nation's first museum on the history of circus band music.

Both are active members of the Windjammers, a national organization of circus band musicians and fans. Ward is its secretary and plays the sousaphone at circus performances near and far.

He remembers the days when circuses had their own traveling bands for parades and performances and when music was written especially for circus acts.

With this tradition fading, the Stauths want to memorialize it in a museum financed through a trust fund from profits from the subdivision. They plan to donate a 60-acre plot on which Ward and his wife live to the Windjammers for the museum. Ward has more than 1 million feet of circus music he has taped and plans to give to the museum.

Meanwhile, the brothers are keeping circus music very much alive in Harrison County. They have played at the annual SWCD meetings for nearly a quarter of a century. In recent years they have provided entertainment for nearly 500 people at these meetings with full performances provided by circus musicians from around the country.

Mr. Conant is district conservationist, SCS, Corydon, Indiana.

Tough 'Tioga'

by Jack R. Carlson and Wendall R. Oaks

Finding plants that will do well under harsh conditions and provide erosion control is always a challenge. At SCS's plant materials center in New York, 'Tioga' deertongue has been developed to provide a vigorous cover—with little or no maintenance—on acid mine sites.

You might say that deertongue "volunteered" for the job.

Plant materials specialists from the Soil Conservation Service observed the native grass, *Panicum clandestinum,* growing on surface-mined land in the Northeast under harsh, acid conditions.

With millions of surface-mined acres in need of a low maintenance ground cover, the specialists assembled deertongue ecotypes from throughout the Northeast at the SCS Plant Materials Center in Big Flats, New York. They screened them for their adaptability and conservation value on acid mine spoil.

The final product is 'Tioga' deertongue, released last year cooperatively by SCS, Pennsylvania State University, and Cornell University. This year, commercial producers harvested seed in New York and Pennsylvania, and expect to market it next year.

'Tioga' is the result of blending 20 strains of deertongue, each of which showed greater acid tolerance than other plants frequently used on mine spoil, including tall fescue, crownvetch, and ryegrass. 'Tioga' has been successfully field tested on acid mine spoil with pH values of 3.5 or lower and normally toxic levels of aluminum and manganese, commonly found around surface-mined areas.

'Tioga' deertongue is a warm season, perennial grass that grows 1 to 3 feet tall. It spreads by seeds which are easily harvested. Its leaves, 1 inch wide and 4 to 8 inches long, are shaped like a deer's tongue—hence, its common name.

Well adapted to barren soils and nearly all moisture conditions, 'Tioga' provides a dominant, vigorous cover on acid mine sites and requires little or no maintenance. It also does well on low-fertility, acid soils, as in gravel pits, where plants such as tall fescue require high maintenance.

With most surface-mined areas in the Northeast being reclaimed for woodland and wildlife habitat, 'Tioga' deertongue has the added advantage of being compatible with young trees. It provides a low-competitive ground cover for reducing erosion in woodland plantings.

Like many other pioneer plants, 'Tioga' deertongue cannot compete where other conservation plants are better suited. It does not do well—and should not be planted—on neutral, high-fertility soils.

Mr. Carlson is manager, Big Flats Plant Materials Center, SCS, Big Flats, New York.
Mr. Oaks is a soil conservationist, SCS, Big Flats, New York.

by D. G. Bidinger

Conservation With an Artist's Touch

Beauty is where you find it . . . and Dorothea Paul has found it with an artist's touch as near as the farms around her in her native Minnesota.

Dorothea Paul has put conservation practices on her land for a quarter of a century. Now she is putting them on canvas.

Her paintings have been on the covers of some of the nation's leading farm magazines, in USDA's Yearbook of Agriculture, in seed catalogs, in national exhibits, and even in her soil and water conservation district office in Olivia, Minnesota.

"I want pictorially to make a history of farming," she explained. "Most of my paintings are of old-time scenes with horse-drawn equipment. I ask my neighbors about the old days and go through old parts books from implement manufacturers. After all, many of the people who remember those days won't be around much longer.

"I also want to show what it is like, what it feels like, to be on a farm and live in a rural area."

Mrs. Paul knows what it is like, for she has known farming nearly all her life. At the age of 10, she was planting corn with real horse power on her father's farm.

Today, she farms 320 acres of prime agricultural land in southern Minnesota near Morton. She grows peas and corn for nearby canneries as well as soybeans, oats, and wheat. She does all the work herself with the exception of harvesting. "It's just not economically feasible to buy a $60,000 combine," she explained.

She and her husband George, who works for the state highway department, have three grown children.

Mrs. Paul got into painting about 11 years ago when she switched to crops after raising cattle.

"I had some spare time and I was looking for something different to do," she said. Her only training in art was a design course she had taken

This scene from the past—a horse-drawn schoolbus—by Mrs. Paul has been on the cover of The Farmer magazine and in the 1975 Yearbook of Agriculture. (Courtesy of The Farmer, The Webb Company, St. Paul, Minnesota.)

as a student at the University of Minnesota. She began taking art courses at home and has since studied in Nebraska and Texas.

"I really got my start when the Minnesota Farmer used two of my paintings in 1972, one on the cover and one inside."

Since then, she's found her "something-different-to-do" hobby has taken her around the country, including Hawaii, to paint and to exhibit. She has painted farm scenes for people and companies in 48 states and 7 foreign countries.

She frequently paints on a theme she knows well: Conservation. A long-time cooperator with the Renville Soil and Water Conservation District, she was the first woman in the state—in 1964—to be selected as an outstanding conservation farmer by the Minnesota Tribune.

The conservation practices she has carried out on her farm include terracing, contour stripcropping, drainage systems, conservation cropping systems, and the planting of 1,700 trees.

"These practices have really paid off over the years," she said. "The contours and terraces really saved my field 4 years ago when we had 12½ inches of rain in 7 hours."

More recently, during Minnesota's "Blizzard of the Century" on January 11, 1975, her farmstead windbreak "really kept the snow out of my yard. I'm now planning a windbreak strip around the edge of the farm to control wind erosion."

Once a year, she flies with a neighbor in his crop sprayer to take photographs of farms for layouts in her paintings. That is when she sees conservation from yet another perspective.

"You've never seen anything prettier from the air than contour stripcropping. It's just beautiful—to look at, to paint, and, of course, to protect your soil," she said.

Mr. Bidinger is a soil conservation technician, SCS, Olivia, Minnesota.

Meetings:

December

6–10	American Geophysical Union, San Francisco, Calif.
7–9	American Seed Trade Association, Inc., Sorghum Research Conference, Chicago, Ill.
8–9	American Forest Institute, San Francisco, Calif.
9–10	American Seed Trade Association, Inc., Soybean Research Conference, Chicago. Ill.
10–17	International Symposium on Land Subsidence, Sponsored by International Association of Hydrological Sciences, Anaheim, Calif.
13	"Drainage for Increased Crop Production and a Quality Environment," Sponsored by American Society of Agronomy, Crops Science Society of America, and Soil Science Society of America, Chicago, Ill.

January

9–12	American Farm Bureau Federation, Honolulu, Hawaii
9–13	National Council of Farmer Cooperatives 48th Annual Meeting, San Juan, Puerto Rico
10–14	North American Game Breeders and Shooting Preserve Association National Convention, Milwaukee, Wisc.
16–19	National Wool Growers Association—National Lamb Feeders Association Convention, Monterey, Calif.
30–Feb. 5	American National Cattlemen's Association Annual Convention & Trade Show, Atlanta, Ga.

February

2–5	Catfish Farmers of America, New Orleans, La.
6–10	National Association of Conservation Districts, Atlanta, Ga.
8–12	American Seed Trade Association, Inc., Garden Seed Conference, New Orleans, La.
13–15	Sprinkler Irrigation Association Technical Conference, Salt Lake City, Utah
14–18	Society for Range Management Annual Meeting, Portland, Oreg.
20–25	American Association for the Advancement of Science, Denver, Colo.
22–25	Land Improvement Contractors of America, Orlando, Fla.
23–24	Southern Forest Institute, Inc., Houston, Tex.
25–28	American Association of School Administrators Convention, Las Vegas, Nev.
27–Mar. 5	American Society of Photogrammetry, Washington, D.C.

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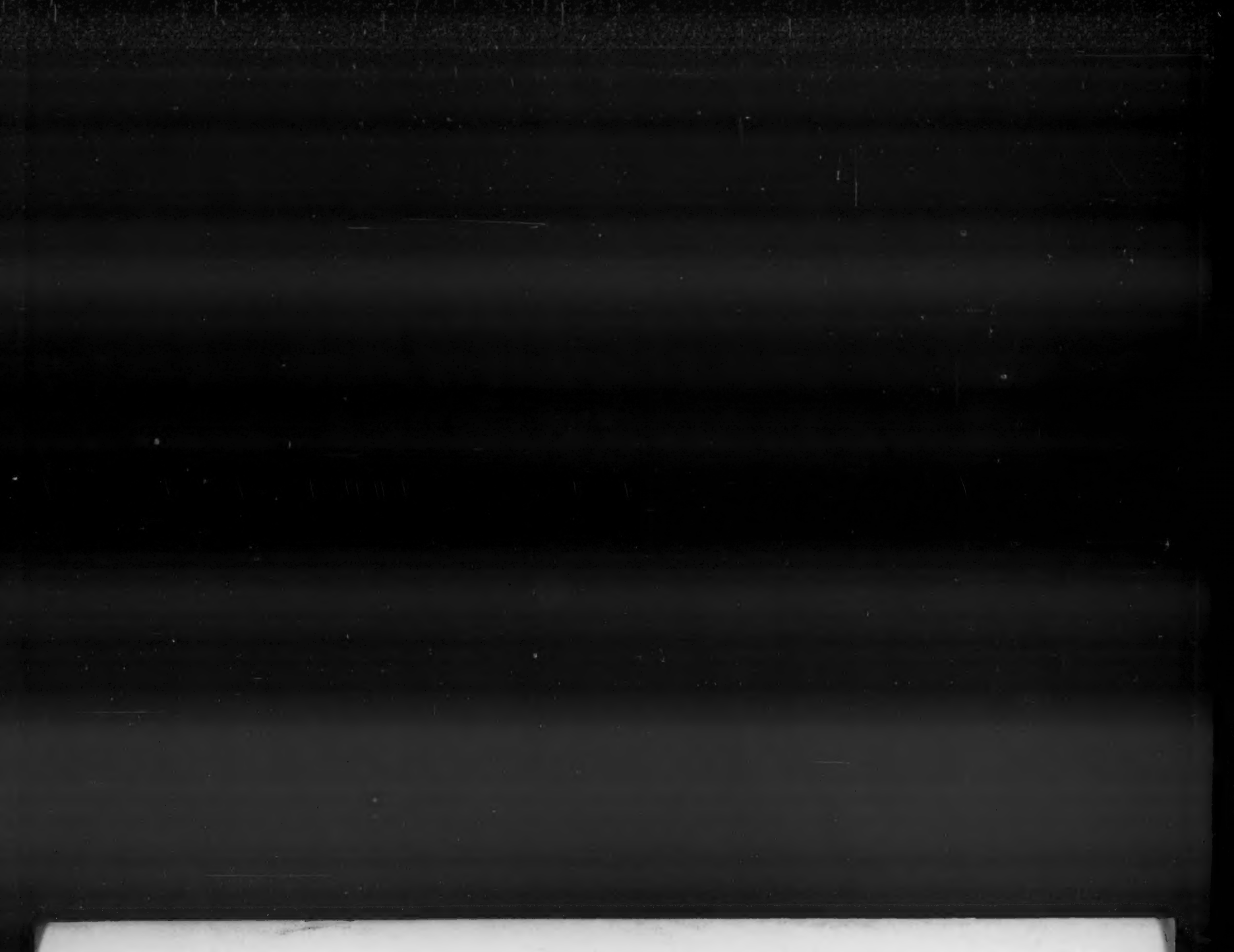
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